ABSTRACT
The speed of articles carried on a conveyor formed of freeturning rollers may be modified by applying to the rollers a driven brake.

2 Claims, 1 Drawing Figure
ROLLER SLAT CONVEYOR

FIELD OF THE INVENTION

The invention relates to controlling the speed of articles carried on a roller slat conveyor.

DESCRIPTION OF PRIOR ART

Conveyors of the chain-carrying roller slat type have proved very satisfactory in newspaper dispatch rooms for many years, such conveyors carrying stacked bundles of newspapers supplied from stacks fed in turn from the presses. Application of top and bottom brake shoes to roller slat conveyors, see U.S. Pat. No. 2,959,273 and No. 3,406,810, have permitted control of their speed for spacing, stopping, starting, etc. of the stacks of newspapers, which control assists in the packaging process. All such conveyors modified by brake shoes as described in the above-mentioned patents have worked in the speed range of 50 to 70 ft./min.

With the advent of high-speed presses providing about 70,000 copies per hour, hand flying from the standard paper dispatch conveyor on to the mailing room conveyor is no longer possible and stacking machines have been developed to automatically take care of this function. They are arranged to deliver stacks of newspapers at rates up to one stack per second. Discharge rates of stacks of newspapers from the stacker are as high as 240 ft./min. Because each newspaper in the stack has a double fold, one corner of the stack is high and the other low. As a result, stacks of newspapers delivered from a stacker on to a standard roller slat conveyor tend to spill when they are subjected to deceleration, this tendency increasing with increased increase in speed. Stacker manufacturers have endeavoured to overcome this problem by transporting the stacks over a series of belts with each belt being run at a somewhat slower speed than the previous belt. However it has been found that the results with this arrangement are sufficiently inconsistent to still make it necessary to employ a man at the stack output to manually ensure that none of the stacks is spilled.

As already mentioned, roller slab conveyors have been developed using brake shoes whereby the speed of movement of the article thereon may be varied. However, the control of such conveyors is not sufficiently accurate at a high speed of stacking in order to prevent spillage because the support rail on the underside of the conveyor imparts various degrees of spin to the rollers as they move along and off the rail to the position where the stacks are received.

Accordingly, it is an object of the invention to provide a roller slat conveyor in which the reverse spin imparted to the rollers as a result of their movement on the support rail on the underside of the conveyor is corrected and a forward spin imparted to the rollers.

SUMMARY

The invention consists in providing a driven friction member, located on the conveyor frame, which member is rotatable at any desired speed, the member being in contact with the rollers of the conveyor after they leave the support rail.

BRIEF DESCRIPTION OF THE DRAWING

The invention will now be described in relation to the accompanying drawing which is a perspective view, with parts cut away, of the end portion of a roller slat conveyor, including a driven friction member constructed according to a preferred embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the drawing, an end portion of a roller slat conveyor, generally denoted by the numeral 10, is shown, this conveyor being of the type illustrated in U.S. Pat. No. 2,959,273 issued Nov. 8, 1960. It will be understood that the invention is equally applicable to any endless roller slat conveyor in which the rollers translated during conveyor operation are mounted for rotation.

The moving operation of the conveyor 10 comprises a pair of spaced-apart, endless, chain-like forms, generally denoted by the numeral 12. These endless elements 12 comprise a plurality of triangular bearing links 14 connected together by coupling links 16.

As illustrated, the links 14 and 16 are supported by rails 18 mounted on a suitable support, not shown. The links 14 and 16 of each chain-like form 12 pass over end sprockets 20 which are mounted on a suitable drive shaft 24.

As illustrated more particularly in the drawing, the endless conveyor 10 comprises in addition to the spaced-apart endless elements 12, cross slats in the form of rollers 26 carried by shafts 28 journaled in opposed bearing links 14 of the endless chain elements 12.

The roller slat conveyor 10 so far described is of conventional design and in itself forms no part of the present invention and in this arrangement the rollers 26 are given a reverse spin in relation to the forward movement due to contact with the support rail 18. Consequently, when these rollers 26 leave the support rail 18, they continue to spin in this manner so that when they arrive at the top, the spin is in the reverse direction to that of the forward translation of the rollers 26.

The invention consists in providing a rotatable friction member 30 which is illustrated more particularly in the drawing. The rotatable friction member 30 is in the form of a hollow roller provided at each end with bearings 32 which are in contact with the drive shaft 24. The rotatable member 30 is prevented from transverse movement along the drive shaft 24 by means of collars 26 and 38 which are fixedly secured to the shaft 24 be means of keys 40 and 42, respectively.

The surface of the rotatable member 30 is provided with a rubber or other friction covering 46 and is of a thickness which ensures its contact with the conveyor rollers 26 at the end of the conveyor 10 and after the rollers 26 leave the support rail 18.

As illustrated more particularly in the drawing, the rotatable member 30 is driven by a suitable sprocket 50 and a chain 52, the other end of the latter surrounding a sprocket 54 held in place by a collar 56 located on a drive shaft 58. For simplicity of operation, the drive shaft 58 is driven by means of cooperating gears 60 and 62, the latter being secured to a sprocket 64 with surrounding chain 66, the other end of the latter surrounding a sprocket 68 which is keyed to the drive shaft 24, which in turn drives the endless elements 12.

The action of the rotatable friction member 30 and the rollers 26 is as follows. The support rail 18 provides the rollers 26 with reverse spin in relation to the forward movement and if this is not corrected, the result would be that the rollers 26 could have a zero surface speed when they come to the top of the conveyor, though this would eventually change to provide a surface speed which matches the speed of the chain links 14. However, as already indicated, the reverse spin makes it impossible for the conveyor 10 to remove stacks of newspapers without spillage. In order to correct this spin, a forward spin is given to the rollers through operation of the rotatable friction member 30, this being driven in the same direction as the chain links 14 with the result that the rollers 26 as they arrive at the top of the conveyor 10 are provided with a desired surface speed depending on the ratio of the drive gears and sprockets.

It will be appreciated that in addition to correcting the reverse spin by a single driven friction member other driven friction members 30 may be located inside the conveyor, each driven at a different speed in order to provide the proper deceleration of the conveyor and remove the tendency to spillage of the stacks.

We claim:

1. A roller slat conveyor having upper and lower reaches and having the roller slats thereof rotatable and freely supported at their ends; drive means for driving said roller slat conveyor; and driven friction member means to drive the
3,675,760

3. Roller slats of said conveyor, one at a time, seriatim; so that the driven direction of rotation of the upper side of each driven roller slat, in turn, is in the same direction as the direction of travel of the roller slats in said upper reach; wherein said driven friction member is a friction roller.

4. A roller slat conveyor according to claim 1, wherein the ends of said roller slats are bearingly engaged in chain links; and said drive means for driving said roller slat conveyor includes a sprocket engageable with said chain links at one side of said conveyor; said sprocket being secured to a drive shaft, and said driven friction member being connected to said drive shaft.

* * * * *